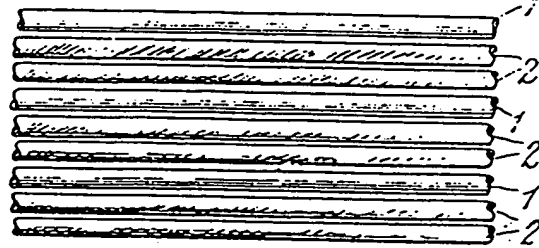


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Fig. 2.



[This Drawing is a reproduction of the Original on a reduced scale.]

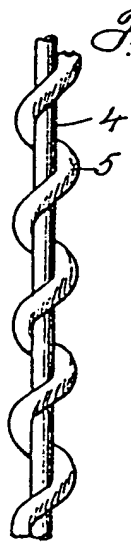


Fig. 3.

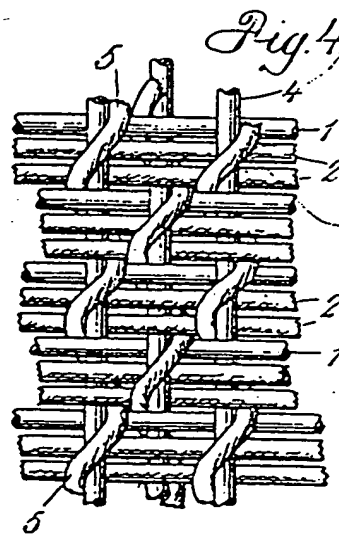


Fig. 4.

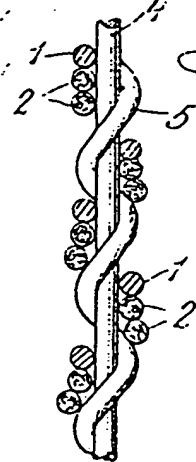


Fig. 5.

Fig. 6.

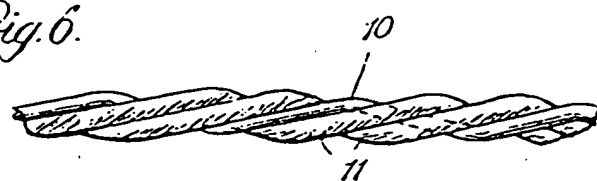


Fig. 7.



Fig. 8.



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# PATENT SPECIFICATION



187,327

Application Date: July 18, 1921. No. 19,338 / 21.

Complete Accepted: Oct. 18, 1922.

## COMPLETE SPECIFICATION.

### Improvements in and relating to Woven Fabrics.

I, CHRISTOPHER H. R. WOODWARD, a citizen of the United States of America, of 42, Broadway, City, County and State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

0 This invention relates generally to the construction of fabrics requiring great strength or durability or both, of the type in which the warp is composed of metal and fibre threads and the filling or weft  
15 also of metal and fibre threads, the whole forming a compound fabric comprising a complete metal fabric and a complete fibre fabric, unified at the time of manufacture.

20 According to the invention the fabric is composed of warp metal and fibre elements and the filling comprises metal elements having fibre elements twined therearound, the different coils of the last  
25 named fibre elements being spaced apart from one another at intervals predetermined by the spacing of the metal elements of the warp and arranged to cause contact of metal and metal at the  
30 crossing points of the metal warp and metal filling elements.

It has already been proposed in fabrics of the type to which the invention refers, to use in some cases metal threads completely covered with fibrous material and  
35 in other cases to use a compound thread, of wire and fibrous material, spun in the ordinary way and woven in any desired manner.

40 And in order that the invention may be better understood it will now be described with reference to the accompanying drawings in which:—

45 Fig. 1 is a face view indicating the manner in which the warp threads are laid.

Fig. 2 is an enlarged transverse sectional view thereof.

[Price 1/-]

Fig. 3 is a detail side view of one of the filling members. 50

Fig. 4 is a face view showing a portion of the complete fabric.

Fig. 5 is a transverse sectional view thereof.

Fig. 6 is a side view of a modified form of filling member. 55

Fig. 7 is a side view of the metal element of this modified filling member.

Fig. 8 is a transverse section of this metal element. 60

In constructing the fabric according to the invention metal and fibre threads in both the warp and filling are employed, the relation of these metal and fibre threads to one another differing however  
65 in the warp and filling.

In the warp of the fabric the metal and fibre threads may be laid parallel to one another while the number of fibre threads for each metal thread may be varied, as  
70 may seem desirable, according to the use to which the fabric may be put. In the embodiment of the invention illustrated in the drawings, the warp is composed of  
75 sets each comprising a single wire 1 and a pair of fibre threads 2 all extending in parallel relation to each other.

The filling is composed of wire threads 4 around each of which is twined a fibre thread 5, the different turns or coils of the  
80 fibre having a slight spacing apart so that during the weaving the fibre automatically adjusts itself to receive the warp wires between its coils or turns so that the  
85 warp and filling wires always contact at their crossing points and danger of cutting or nipping the fibre filling member between the crossed wires is avoided.

With the fabric as thus constructed, the wire and fibre form fabric units each  
90 complete in itself, while the presence of the fibre content enables the unified fabric to be vulcanized as known with fabrics of this type.

In the manufacture of certain fabrics, 95 as for instance when asbestos is employed

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as the fibrous material in the construction of brake linings, one of the fibre elements of the warp may be turned around the metal warp element it being understood that the term fibrous material is applied to asbestos also

A filling member constructed as shown in Figs. 6, 7 and 8 may also be employed comprising a metallic and a fibrous element each separate in its origin, with the metallic element arranged in convolutions so spaced as to cause the fabric element to complement the same when wrapped round the metallic element, and thereby secure a positive and independent seat or support in the respective convolutions for each turn of the fibre element and preventing any tendency on the part of the fibre element to slip along the metallic element.

In these figures of the drawing, the reference 10 indicates the metallic or wire element of the thread or yarn which may be constructed of soft steel or of any other suitable metal.

Previous to its uniting with the fibre element, which latter may consist of one or more strands; the wire element is wound or twisted into comparatively long spiral convolutions as indicated, these convolutions being spaced or arranged according to the fibrous element to be used.

In the present instance the fibrous element comprises a pair of strands 11 which may be of cotton or any other desired material.

In spinning the thread, the fibre element is given one turn around the wire element for each convolution of the latter, the feed of the spinning machine being suitably arranged to accomplish this.

The result obtained, as is clearly evident from Fig. 6, of the drawings, is that each convolution of the wire forms

an individual seat or support for each turn of the fibre element, thereby holding or localizing each turn of the fibre element with its exact position on the wire element.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A fabric composed of warp metal and fibre elements and a filling comprising metal elements having fibre elements twined therearound, the different coils of the last named fibre elements being spaced apart from one another at intervals predetermined by the spacing of the metal elements of the warp and arranged to cause contact of metal and metal at the crossing points of the metal warp and metal filling elements, for the purposes set forth.

2. A fabric as claimed in Claim 1, having the warp composed of metal and fibre elements laid parallel to one another.

3. A fabric as claimed in Claims 1 or 2, in which fibre elements of the warp are twined around metal warp elements.

4. A fabric as claimed in Claims 1, 2 or 3, in which metal elements around which fibre elements are twined are formed in convolutions preferably spiral in form to constitute seatings in which the turns of the fibre elements are localised, preferably by being wrapped therearound.

5. Fabrics composed and manufactured as herein described and shown on the accompanying drawings.

Dated this 18th day of July, 1922.

BROWNE & Co.,

Agents for the Applicant.

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